

BUREAU OF ENVIRONMENT CONFERENCE REPORT

SUBJECT: NHDOT Monthly Natural Resource Agency Coordination Meeting

DATE OF CONFERENCE: July 21, 2021

LOCATION OF CONFERENCE: Virtual meeting held via Zoom

ATTENDED BY:

NHDOT

Andrew O'Sullivan
Matt Urban
Mark Hemmerlein
Rebecca Martin
Arin Mills
Samantha Fifield
Maggie Baldwin
Cassandra Burns
Jason Abdulla
Meli Dube
Marc Laurin
Trent Zanes
Tony King
Sarah Healey
Jennifer Reczek
Kerry Ryan
Tim Boodey

Joseph Jorgens
Jim MacMahon

EPA

Jeanie Brochi

NHDES

Lori Sommer
Karl Benedict
Cheryl Bondi

NHB

Jessica Bouchard

Federal Highway

Jaimie Sikora

The Nature Conservancy

Pete Steckler

LCHIP

Paula Bellemore

Consultants/ Public Participants

Christine Perron
Susan Francher
Tracey Boisvert

PRESENTATIONS/ PROJECTS REVIEWED THIS MONTH: *(minutes on subsequent pages)*

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NOTES ON CONFERENCE:**Finalize Meeting Minutes**

Finalized and approved the June 16, 2021 meeting minutes.

New London, 42877, X-A004(976) – July 21 Natural Resource Agency Meeting.

Sarah Healy described the purpose and need of the project, which is the expansion of the Exit 12 Park and Ride located off NH Route 103A in New London. The Park and Ride is close to 100% capacity most days causing illegal parking within the lot and along NH 103A, interfering with bus circulation and snow removal. The lot has 122 existing parking spaces and the project proposes to add up to 50 more spaces. Concerns have been expressed from the Town regarding losing the tree buffer to NH Route 11 along the north side of the lot. A stream and wetlands are located east and south. Drainage is located along the west side. Conservation land is located south of the Park and Ride property.

Marc Laurin briefly described the environmental resources. The small stream located to the east of the lot runs north to south from a culvert under I-89, it follows along the toe of slope of I-89 and empties into a large wetland in the conservation land. The stream connects in the wetland to an Unnamed Brook which flows under NH 103A and is a tributary to Herrick Cove of Sunapee Lake. M. Laurin described the five wetlands within the project limits. A couple small emergent wetlands are located along the east side of the lot and east of the stream further south of the Park and Ride. The large forested/emergent wetland, associated with the Unnamed Brook, is at the far southern edge of the property and in the adjacent conservation land. It abuts NH Route 103A. A forested wetland is located just to the south of the parking lot and receives surface flows from the pavement. The wetland flows to the east and flows through an old culvert under a woods road. It follows along the old road to the south and enter the large forested/emergent wetland in the adjacent conservation land. A small emergent wetland, which receives lot and roadway drainage is locate adjacent to the south entrance to the lot.

An archeological review was conducted in 2018 and a walk-over done by BOE in June confirmed that there are no archaeological, nor historic resources present. There are no floodplains and the unnamed tributary to Herrick Cove has been identified as impaired for chlorides. NHDOT will continue to use the Statewide Salt Policy to manage salt applied to the lot. NHDOT is evaluating the treatment measure for stormwater runoff in accordance with the AoT regulation to achieve treatment of 2 times the new impervious area. The conservation lands that abut the property will not be impacted. The NHNHB database search identified no rare species within the project area. A Programmatic Evaluation of the endangered NLEB is expected to return that the project will likely adversely affect the species due to the proposed tree clearing. NHDOT will follow the USFWS' standard mitigation measures. No air quality or noise impacts will occur.

Sarah H. described the two alternatives that the Department is evaluating and detailed the potential impacts and constraints of each. The North Alternative expands the lot to the northeast and would be adjacent to the northbound on-ramp. It would add 44 spaces and impact a portion of the tree buffer. It would have a small impact to Wetland A that would not require mitigation.

NHDOT has concerns that there may be rock, as there are rock outcrops close to this area, further geotechnical investigations are planned as the design is advanced. The South Alternative expands the lot along the south edge of the lot and would add 51 spaces. The expansion would be on fill and have wetland impacts to Wetland D, the forested area, and Wetland E, the emergent area by the entrance. As the impacts are less than 10,000 square feet, no mitigation would be required. The fill slopes would avoid the small stream to the east side. Potential water quality treatment of porous pavement could be accommodated as the expansion would be on fill, and would be more feasible than at the North Alternative, where shallow bedrock is expected. Additionally, treatment swales are being evaluated and would likely increase the slope into the forested area.

Jason Ayotte further explained that the 50 space expansion is a goal of this CMAQ-funded project and the design team has evaluated several variations of the alternatives. NHDOT is partnering with Dartmouth Coach who is also providing some funding. The tree buffer to the north is important to the Town, as they have zoning restrictions along the I-89 interchanges. NHDOT understands the Town's initial concerns, and the goal of presenting to the resource agencies is to gather feedback and relate concerns to the Town and Dartmouth Coach.

Lori Sommer stated that NHDES would prefer the least impacting North Alternative, as it seems that the functions and values of Wetland D are more valuable than those of Wetland A. The South Alternative impacts are also close to the stream, she suggested seeing if the fill could be further from the stream and leaving a tree buffer. Also, the north tree buffer is limited in wildlife value compared to the more valuable forested area to the south. L. Sommer inquired about providing water quality treatment to the west of the North Alternative.

Carol Henderson agreed with Lori's assessment of the value of the forested area to the south, and also feels that the North Alternative would be less impacting to wildlife. J. Ayotte noted that treatment to the west would impact more of the tree buffer concerns of the Town. C. Henderson asked if the North extension could be similar to the south (along all of the north edge) and would recommend additional plantings to mitigate the buffer loss. S. Healey stated that NHDOT looked at this expansion, however it ends up impacting more of the tree buffer. NHDOT would investigate landscaping and discuss with the Town.

Mike Hicks asked about the impacts to wetlands of both alternatives. S. Healey stated that the North Alternative would be 100 square feet and the South Alternative about 2,200 square feet. Trent Zanes further elaborated that if treatment of the new impervious area were with swales these impacts would likely increase to the south.

Jean Brochi also felt that the functions and values impacted with the South Alternatives would be greater. She stated that a full evaluation needs to be done.

Pete Steckler also agreed with Lori and Carol's comments on the potential impacts to functions and values. He asked if the North Alternative impacts to the tree buffer could be minimized by expanding to the west, creating a more linear expansion to minimize the tree buffer. S. Healey responded that the team reviewed the concept and found more clearing was needed due to the grading required.

Matt Urban asked if the small North Alternative impacts to Wetland A could further be reduced with a 2 to 1 slope. Tony King replied that guardrail would be needed and that would further impede snow removal. The design team will evaluate grading for the selected alternative during final design.

Jason Ayotte concluded that the Department will be doing additional coordination with the Town and Dartmouth Coach, and evaluation of the constraints of the two alternatives. The team will return to further discuss the project with the resource agencies.

Dummer-Cambridge-Errol, #16304B (X-A004(699))

Christine Perron introduced the project, which consists of a 1.3-mile segment of NH Route 16. The proposed project entails shifting NH Route 16 to the west, away from the river, with that shift ranging from 15' to 385'.

The objective of the meeting was to provide more details on proposed wetland impacts and to start setting a more definitive direction for mitigation.

Representative impact areas were reviewed along the project. Design and resource impacts are close to being final but there are design elements that are still being refined so impacts should still be considered preliminary. Some of the refinements that still need to be made are related to minimizing wetland impacts. Throughout design of the project, avoiding and minimizing impacts as much as possible has been a major focus. Three important factors have resulted in a large reduction in impacts:

Alignment was chosen to reduce impacts to wetlands, vernal pools, and floodplains.

Compensatory floodplain storage was located and designed to reduce wetland impacts.

All slopes have been steepened to 4:1 adjacent to wetlands, which is the steepest possible side slope allowed without guardrail. Aesthetic concerns through the project area make long runs of guardrail undesirable.

Most of the wetland impacts from the project are related to fill slopes and the new roadbed associated with the alignment shift. Impacts to the bank of the Androscoggin River are primarily from proposed drainage pipes, many of which are needed for snow curb basins, which are low point basins that only catch pavement runoff when and if the plowing of the snow stops the ordinary sheet flow off the shoulder. Impact B at the south end of the project was reviewed. This is an area that is currently getting a closer look. The fill slope that is currently shown extends below OHW but can likely be avoided if slopes are steepened and guardrail is installed along approximately 250 linear feet.

Impacts associated with the southern stream crossing were reviewed. The proposed structure is a 5' wide x 4' high box culvert embedded 1 foot. The proposed alignment shift and culvert replacement will result in 210 linear feet of channel impacts and 118 linear feet of new stream channel constructed at the inlet and outlet, for a net impact of 92 linear feet. The 2:1 side slope along the outlet channel requires stone for stabilization but will be covered and seeded to bankfull elevation. Natural streambed material will be placed within bankfull width and shrubs will be planted along the channel. Bankfull is about 3' upstream and wetted channel is only about 1 foot. These details will be finalized and shown at a future meeting. The 2:1 slopes are proposed in order to reduce impacts to the vegetated buffer.

Impacts associated with the northern stream crossing were reviewed. The proposed structure is a 6'W x 6'H box culvert embedded 1 foot; The upstream wetland is impounded and the proposed culvert was selected as a compromise between improving geomorphic compatibility and reducing impacts to the wetland system that has established here. The proposed alignment shift and culvert replacement will result in approximately 202 linear feet of channel impacts and 25 linear feet of new channel at the outlet, for a net impact of 177 linear feet. Based on comments at the last meeting, providing a wildlife shelf at this crossing was assessed. Vertical clearance with the proposed structure is very limited, with only around 2 feet above water. Providing a shelf with more clearance would require a larger crossing and an increase in roadway profile, resulting in increased wetland, stream, and floodplain impacts and additional lowering of the water levels in the impounded wetland. There is also no terrestrial habitat to tie into upstream and creating that tie-in would require additional impacts. Of particular concern from a permitting standpoint is the additional floodplain impacts because additional flood storage cannot be provided to compensate for the additional fill.

The area of proposed flood storage was reviewed. This area is located near the northern end of the project and was selected because of its proximity to the floodplain and the ability to create storage with minimal wetland impacts. The flood storage area is in the area where the vernal pools are located. Two vernal pools will be impacted by the proposed alignment and four will be avoided. At the last meeting, it was noted that there are two proposed equalizer pipes that are necessary for the flood storage area. Based on the diameter and length, these pipes have an openness ratio of about 0.05. Guidelines for providing amphibian passage generally recommend structures more than 3' with an openness ratio of more than 0.07. Increasing the size of these pipes to provide a better opportunity for amphibian passage was assessed but is not possible because of the cut section required for floodplain mitigation. Design standards are already being bent with the proposed 24" pipes because one is in the sand and one is in the gravel of the new roadbed. Adding a foot to the diameter of each pipe would require bringing the road up one foot and widening the side slopes, resulting in an additional 4' of fill on both sides of the road. This would reduce floodplain storage, resulting in greater net fill in the floodplain, wetland impacts would increase, and two additional vernal pools would be impacted. For these reasons, larger pipes are not proposed.

Impact AN was reviewed. This area entails slope work along the river to match the new roadway into the existing roadway at the north end of project. This will result in impacts along approximately 150 feet of bank.

Total impacts were summarized as follows:

PFO	PEMx	Channel-Tributaries (2)	Channel-Andro	Bank- Andro
225,092 sf	825 sf	3631 sf	385 sf	2295 sf
----- (including 3272 sf Vernal Pools)		----- 412 lf	----- 154 LF	----- 227 LF

Total Wetland	Total Channel	Total Bank
225,917 sf (5.2 ac)	4616 sf	6266 sf
	566 LF*	227 LF

*creating 143 LF, so 423 LF net impact to mitigate

The vegetated buffer was reviewed. The current area of the buffer between existing edge of pavement and the OHW of the Androscoggin is approximately 5 acres, with edge of pavement ranging from 15’ to 70’ from the river. The buffer that will result from the proposed alignment will be approximately 20.5 acres, with the new edge of pavement ranging from 45’ to 450’ from the river. The disturbed area within the new buffer will be restored by placing excavated muck from the project area to retain existing seed bank; planting a seed mix for post-construction stabilization; and adding plantings of woody vegetation along the created stream channels and other specific areas to be determined (such as adjacent to vernal pools).

Anticipated mitigation requirements consist of the following:

Stream Bank:

227 LF

\$67,803 in-lieu fee

Stream Channel (net)

423 LF

\$126,347 in-lieu fee

Vernal pools (2 VPs impacted):

\$500,000 in-lieu fee

Wetlands

225,917 sq ft (5.2 ac)

Land Preservation 20:1 (104 ac)

In-lieu fee \$941,780

To date, there have been no clearly viable options identified for land preservation that could be carried out within the timeframe of the project. Between January 2019 and the present, eight entities have been contacted for suggestions on land preservation opportunities. A few potential properties that were initially identified ended up falling through during landowner coordination. The Conservation Fund and SPNHF identified the Shelburne Forest as a potential opportunity, but this is a \$3 million fundraising project anticipated to be finalized in 2023, which makes it unsuitable as wetland mitigation for the Dummer project. One potential project from the Trust for Public Land is still confidential and the current status is unknown.

The NHDOT proposes that land preservation only be pursued for 13 Mile Woods mitigation and that wetland mitigation be provided via an in-lieu fee. The total in-lieu fee for the project would be approximately 1.6 million. Details such as mitigation credits for the buffer will be discussed over the next couple of months.

A meeting will be scheduled in August with applicable agencies to discuss water quality and stormwater treatment. Impacts and mitigation will be finalized over the next two months, and the project will be discussed at the September Natural Resource Agency Coordination meeting to tie up any loose ends. Permit applications are expected to be submitted in the fall. The tentative advertising date is February 2022, which would put the in-lieu fee payment in late spring 2022 at the earliest, although the ad date will likely be pushed back slightly.

A summary of comments and questions from attendees follows:

Lori Sommer (NHDES): Lori provided the following comments.

Clarification is needed on Areas B and AN – Will there be permanent impacts at these locations? Jason Abdulla responded that those locations are still being assessed but there may be some unavoidable permanent bank impacts. Lori noted that the NHDES bank stabilization rules would need to be addressed for those locations and at the tributaries.

Lori asked if there was an opportunity to provide a dry culvert near the northern crossing for terrestrial wildlife passage. Christine responded that this could be reviewed.

Regarding mitigation, Lori noted that receiving credit for the created channels of the tributaries was reasonable but would entail a permit condition requiring post-construction reporting and monitoring. She commented that permanent bank impacts would require mitigation.

Carol Henderson (NHFG): Carol agreed with Lori's comment on looking into providing wildlife passage opportunities to improve connectivity. She also noted that she would like to see more vegetation in the buffer than what appears to be growing in the buffer of the recently constructed project.

Mike Hicks (ACOE): Mike confirmed that the project would require an Individual 404 Permit. He noted that an EFH Assessment would be needed for any impacts below OHW of the Androscoggin. Christine replied that she had previously coordinated with Mike Johnson on this and determined that the Androscoggin River in NH is no longer designated as Essential Fish Habitat. This determination provided to Mike in writing following the meeting.

Jean Brochi (EPA): Jean agreed with the comments made by others and offered no additional comments.

Pete Steckler (TNC): Pete echoed the request to look into improving connectivity and said he would also like to see the details of the created stream channels. Christine confirmed that those details could be reviewed at a future meeting.

Eaton Culvert Replacement, #1832-H-1

Arin Mills, NHDOT Senior Environmental Manager, and Samantha Fifield, District 3 Civil Engineer, presented the proposed culvert replacement project which carries NH 153 over an unnamed tributary to Crystal Lake. This state funded project proposes to replace the existing granite block crossing with a precast concrete structure. Arin explained the stream drains the Rockhouse Mtn range and from the site it flows about 0.2 miles where it enters Crystal Lake. The crossing is a Tier 3 as delineated by StreamStats. Arin showed some photos to include both the upstream/downstream and inlet/outlet of the existing structure. Dense Japanese knotweed was noted at the site.

Sam gave a project overview, to include the replacement of the existing 8' wide by 4'-7" high granite block with concrete extensions with an 8' wide by 7' high precast concrete box with 2' of embedment. Sam explained the previous permit for rehabilitation was determined to not provide enough benefit for the cost and would also not improve safety, and a replacement was proposed. The new crossing will be extended from 30' to 36' to improve safety and improve roadway maintenance activities. The project will also replace the headwalls and wingwalls. The location has no history of flooding. Sam showed the preliminary impact plans and further described permanent impact due to increase in length. Sam also mentioned the site has constraints on size due to private property/infrastructure adjacent to structure. Sam provided a basic construction sequence and showed a proposed erosion control plan. A chart depicting the results of the

hydraulic analysis for both the existing and proposed structure. Sam said the current design will not pass the 100-year storm event, and therefore will need to be an alternative design. There is no history of flooding at this location and based on stream gauge data for the area, the proposed design will pass a significant storm event.

Arin provided a summary of the environmental review to include the un-named stream is a 3rd order to Crystal Lake, no Shoreland Water Quality Protection Act. The stream is a Tier 3 crossing with a drainage area of 1.34 square miles. No Designated River. A previous permit 2016-03053 for repair that was not constructed and the current proposed project is to replace. The stream is predicted coldwater per the Wildlife Action Plan, with no fish data in the stream. Crystal Lake is a 'Warm to cool acidic lake' and stocked with Brown trout. NHB21-0911 had no species recorded, no Priority Resource Areas identified. There is a dense stand of Japanese knotweed surrounding the project which will be addressed to prevent spread during construction.

Arin showed data from the Stream crossing initiative, which depicted the geomorphic compatibility as 'Mostly compatible' and Aquatic Organism Passage as 'Reduced Passage'. The stream assessment determined the stream a Rodgen type B in the reach with moderate entrenchment, width/depth ratio and slope. The bankfull width of 11.7' in reach and a compliant structure of 16.4'. The crossing is within a 100-year floodplain. The iPaC determined potential for Northern long-eared bat (NLEB) and small whorled pogonia. A 4(d) consistency determination was obtained for the NLEB. A field review for the pogonia determined no plants found and limited habitat potential due to dense stand of Knotweed, a no effect determination was reached. Matt U reviewed the impacts for mitigation are associated with the extension, and no impacts for the proposed temporary pipe. Also, there is existing rip rap in the area and impacts calculated were for the crossing extension, and not for areas of existing rip rap. Lorie S stated mitigation would be likely due to permanent impacts to the Priority Resource Area (PRA) for the extension. Cheryl B asked to follow up with the data from the ARM Mapper to determine findings and reduced passage element based on the SADES ID. Lorie S concurred with the Alternative design and the PE certification would provide the details. She asked about the possibility of a wildlife shelf. Sam F said she could explore the possibility of a wildlife shelf, and would want to ensure it does not further reduce the hydraulic capacity of the crossing. Cheryl mentioned if the reduced passage identified in the SADES data could be improved with the design and Lorie said to ensure the clean water bypass will pass the 2-year storm event. She also asked about Japanese knotweed control. Sam F said the stems would be cut and kept onsite to reduce spread, and possibly explore the use of steel mesh. No herbicide would be used due to proximity to stream and nearby drinking water well.

Carol H said she would defer to DES for time of year restrictions, and encourages the incorporation of a wildlife shelf. Gene B had not comment. Pete S asked if an 8' box or other wider options were considered and Sam F said the 8' wide box was proposed due to limitations on construction equipment and personnel for this state funded and constructed project. She further explained a wider box would exceed the budget.

Wakefield Culvert Replacement, # 2019-M312-1

Arin Mills, NHDOT Senior Environmental Manager, and Samantha Fifield, District 3 Civil Engineer, presented the proposed state funded culvert replacement project which carries NH 153 over a wetland in Wakefield. A map was shown to depict the drainage area using StreamStats, and Arin further explained the draining was from a series of wetlands that extend over the Maine

border. The site is within the Ossipee River headwaters, which reaches from a Belleau Lake to Woodman Lake, Stump Pond, Balch Pond and forms the Ossipee River. The project is adjacent to Woodman Lake and appears to be the local name for the waterbody, as the NWI data does not have a name listed for the waterbody. The surrounding area is primarily soils that are excessively drained.

Arin explained that although the NWI data shows the area of the project as a stream, the field delineation determined the inlet side to be a forested wetland (PFO1F) and the outlet side to be Lacustrine Littoral (L2UB24Hh). Woodman lake is dam controlled with a series of dams; Belleau Lake dam is active/recreational/private, Woodman Lake dam (Chick Dam) is breached, and it is a beaver dam that currently retains water in Woodman Lake. The field delineation did not find stream characteristics at the crossing, but rather Palustrine forested and lacustrine. No previous permits were identified for the location. An aerial map was shown as the area surrounding the site is rural/residential with no conservation lands adjacent. Photographs were shown of the upstream/downstream as well as inlet/outlet.

Sam provided a project overview of the proposed project to replace the existing deteriorated 3' high by 5' wide CMP arch with an 8' wide by 3' high precast concrete box. Both headwalls will be replaced and guardrail will be installed on the pond side to improve safety. Sam explained the crossing does overtop during high rain events. Sam showed preliminary impact plans where the proposed box will match the existing footprint. Sam said the 8' wide concrete box is proposed for both performance and accommodation of wildlife passage. Impact shown are associated with the wider structure. Sam summarized the construction sequence is to install erosion control measures and water diversion, remove the existing culvert and install new from outlet to inlet. The water diversion pipe would then be removed, roadway rebuilt and construct new guardrail. Sam showed proposed erosion control measures.

Arin provided a summary of the environmental review to include the field determination of Palustrine and Lacustrine wetland types and no Priority Resource Area impacts. No additional SWQPA as the project will be covered under the wetlands permit. The site is within the 100-year FEMA floodplain. US Fish & Wildlife Service iPaC determined potential for Northern long-eared bat and a 4(d) concurrence letter was generated. No recorded results from the NHB21-0969 review. Section 106 is complete and an Appendix B under the programmatic agreement is complete. It was noted Belleau Lake is actively controlling Milfoil, and no other invasive species were identified.

Lorie S asked if the lake elevation was known, and what the lake high water level is. Sam said it was not known and Lorie suggested reaching out to the dam bureau and possibly follow-up with Karl ahead of submission to verify Shoreland jurisdiction. Lorie further asked about hydraulics and Sam said the proposed box would double the hydraulic opening to avoid overtopping the road and would have no impact to properties above the inlet. Lorie asked that be included in a narrative with the application, and no mitigation is anticipated as there are no PRAs within project area. Carol H encouraged installation of a wildlife shelf. She confirmed Belleau lake does have Milfoil and is likely in Woodman lake as well. She suggested the use of a fragment barrier to prevent further spread. She recommended to keep aware of possible Milfoil if identified during construction. Mike H and Genie B had no comment. Pete S asked if raising the road was considered to reduce flooding and possible use of FEMA funding.

Middleton, #43067

Rich Brereton from FBE introduced the project on behalf of NHDOT Environmental Manager Arin Mills and Ralph “Sandy” Sanders of District 6, which had been presented at the January 2021 NRAM by Arin and Sandy.

Rich presented the project, a culvert replacement where an unnamed stream crosses under NH Route 153 in Middleton. The proposed work includes replacing the existing culvert structures, a 36” corrugated metal pipe (CMP) and a 24” reinforced concrete pipe, with twin 49” span x 29” rise coated pipe arch culverts with end sections. In addition, the project proposes to replace the existing, deteriorating riprap above the inlet and to install 4.5 feet of new riprap to fill a gap between the existing riprap and the new end section on the inlet. NHDOT’s Standard Dredge and Fill Wetlands permit application will include this work.

Next, Rich discusses the construction constraints of this project and selection of the twin pipe arch culvert design. Structure strength is a primary concern due to heavy logging truck traffic. The lack of elevation of the roadway above the streambed limits the height of the structure that can be accommodated. District 6’s selection of a twin pipe arch design achieves sufficient hydraulic capacity with only a 29” rise. Rich then reviewed the natural resources present, noting that a wetland delineation was conducted by NHDOT in spring of 2020. This delineation identified the stream as the only water feature in the direct work area. Draft wetland impacts under the proposed work are limited to the permanent impact of the end sections (8’ on either end) and the 4.5’ of new riprap along the bank above the inlet. Rich noted that dewatering measures will be included on the final erosion control plans along with temporary erosion control measures, likely silt sock around the perimeter.

Rich reviewed the Chapter 900 rules observed for the stream crossing. He noted that all information required under 903.04 has been collected and that there was no information about the unnamed stream on USGS maps, but the watershed has been delineated in HydroCAD as a 166-acre tier 1 stream. All design standards under 904.01-03 will be observed. Rich notes that this project meets the requirements of 904.08 as there has been no history of overtopping or flooding and that moving from a concrete culvert to CMP will enhance aquatic organism passage. The pipe arch culverts will increase hydraulic capacity and connectivity of stream channel habitat. All of the work for this project will take place in the right of way.

Rich showed a map of wildlife habitat and rare species. The area surrounding the project area of impact is supporting landscape with no highest classified habitats within the proposed work area. The USFWS IPAC review nearby habitat for northern long-eared bat, for which 4(d) concurrence has already been issued, and small whorled pogonia, for which there will be no habitat in the managed right of way. Arin Mills added the clarification that there was no record of small whorled pogonia in the area, only habitat.

Matt Urban noted that the temporary impacts would be smaller than shown in the hand sketch, limited only to the area within the top of bank. Rich agreed and noted that FBE is partnering with HEB Engineers who will produce the final wetland impact plans. Matt then asked for confirmation that the permanent impacts would be limited to the areas where the end sections are proposed, and Rich clarified that the permanent impacts will also include the 4.5' of new riprap.

Andy O'Sullivan asked for clarification on the total linear impacts of this project. Rich responds that there will be 20.5 total feet of permanent stream channel impact due to the culvert end sections and installation of riprap. Andy asked if this means that the proposed work falls under the minimum impact designation. Rich noted that in the January 2021 NRAM meeting Karl Benedict had said project is proceeding down the path of a minimum impact classification, but the classification will be verified once the final impacts are determined and it can be confirmed that the impacts to the watercourse are less than 50 LF.

Cheryl Bondi (NHDES) asked if the proposed twin culverts are going to be embedded with stream simulation for the purpose of increasing AOP. Rich states that the embedding the bottom of the replacement twin culverts is not included. Cheryl then states that unless the new pipes are embedded with stream simulation this project does not meet 904.01 and therefore cannot fall under the minimum impact designation.

Carol Henderson (NH Fish and Game) asked if the use of a single pipe instead of twin pipes had been considered. Rich responds that the rationale for selecting the twin pipe arch culverts was to achieve sufficient capacity to pass the 50-year storm event requirement under the constraint of the roadway's elevation above the streambed. Sandy added that the twin pipe arch design also allows less horizontal separation between the two pipes (14") than concrete pipe would (3'), and further, that corrugated pipe is better for organism passage than concrete as there is increased traction and sediment accumulation within the pipe. Carol then asks for further clarification about the consideration of using one pipe at this location. To which Sandy responds that it was not considered because one pipe would not work at this location. Arin states that not all elements could be met given the site constraints and that Sandy looked at these elements to make the best decision.

Cheryl then asked if the option of using a concrete box culvert with open bottom was considered for the purpose of maximizing horizontal width. Cheryl also questioned if twin pipes preclude the project from being classified as minimum impact. Sandy responded with regard to Cheryl's first question that a box culvert was not considered because cost and installation time are greatly increased and larger equipment is needed. Sandy noted that the no federal funds are being used for this project so the budget is relatively small.

Lori Sommer (NHDES) said that, as followup, she would need to confer with Karl Benedict (NHDES) and reserves further comments on design. She concurred with Cheryl that it was likely this project would be designated as minor impact rather than minimum, and that mitigation will not be required. Andy suggested that Rich follow up with Lori and Karl via email to clarify project impact type.

This project has been previously discussed at the Monthly Natural Resource Agency Coordination Meeting in January of 2021.

Bath, #43247, (X-A005(062))

Chris Carucci, NHDOT Bureau of Highway Design, introduced the project and provided a description of the project location, existing conditions, project purpose and need and proposed alternatives. The project is federally funded and is scheduled to advertise in February 2022 with anticipated construction in summer of 2022. The purpose of the project is to address the poor structural condition of an existing 6' wide x 3' high x 40' long concrete box culvert carrying an unnamed stream under US Route 302 approximately 1.6 miles south of Cate Road in the Town of Bath. The crossing is a Tier 3 based on drainage area of 1023 acres (1.6 sq. miles) based on LIDAR contours.

This culvert was selected for the Culvert Rehabilitation and Drainage Repair (CRDR) Program based on structural condition, risk of failure, and lack of suitable detour routes. The culvert slope is approximately 0.25% with a very low fill height of less than 1' of cover, and US 302 average daily traffic volume in 2019 was 3,582. US 302 is the only major route connecting Haverhill, Bath, and Lisbon to Littleton and the I-93 corridor. The existing culvert was originally constructed in 1930 at 36' long. No record of the lengthening was found, however, the current condition is 40' long. NHDOT District 1 Maintenance reports some repairs have been made in the past, including placing a steel plate over the top of the culvert. There is no history of flooding related to this culvert, but there is a history of roadway overtopping due to water levels and ice jams in the Ammonoosuc River. The FEMA 100 year flood elevation in the vicinity of the culvert is about 5' higher than US 302 and up to 9' higher than the lowest parts of the surrounding fields.

There are active agricultural operations on both sides of US 302 in the vicinity of the crossing. The culvert inlet channel is approximately 5' wide x 3' deep at 2.3% slope, and is bordered by crops on both sides. The outlet channel bends sharply to the right, runs just outside the ROW for about 300', then bends sharply to the left and runs another 200' before it connects with the Ammonoosuc River. The outlet channel is about 4' to 6' wide x 2' deep, at 0.8% slope. Field review found no evidence of erosion or sedimentation caused by the culvert. Both the inlet and outlet channels are shallow and have relatively low capacities before overtopping occurs. There was evidence of recent agricultural channel maintenance, with the adjacent tilled fields being a likely chronic sediment source. There was no perch at the inlet or outlet. There was an inch or two of sediment in the culvert providing the appearance of a natural bottom.

NHDOT sent letters to the two abutters requesting info on flood history, damage, or impact to farm operations. Abutter Miles (south side of inlet) had no specific concerns about the culvert. He did note that the inlet and outlet channels require periodic maintenance and suggested that the inlet channel be straightened out. The other abutter did not respond.

A stream assessment was performed by NHDOT on 5/14/2020. The stream flows through a very highly channelized and influenced stream channel for several hundred feet upstream and downstream of the crossing as the stream traverses the agricultural landscape and Ammonoosuc River's floodplain down to its confluence with the River. Bankfull width upstream was 8.0' and downstream was 9.3'. The reference reach was upstream and outside of the area of influence of the crossing and in an area where the influence by the surrounding agricultural development was minimized to the maximum extent practical. Farther upstream of the reference reach the stream's slope and characteristics change to a mountainous system. The reference and stream reach near the crossing is at the inflection point where the stream's slope and characteristics reflect the stream's position within the Ammonoosuc River's floodplain (more gradual slope, finer sediments, and more entrenched). Bankfull widths for the reference reach were 8.8' and 8.0'. Floodprone width varied from 11.4' to 9.0'. The reference reach was determined to be a Rosgen Stream Type "A". Based on the reference reach's Rosgen Stream Type the entrenchment ratio multipliers are 1.0 to 1.4. Using the average bankfull width of 8.5' and average entrenchment ratio of 1.2, the compliant structure span would be 10.2', rounded to 10' for design.

The entire project area is located in a FEMA flood zone AE due to proximity to the Ammonoosuc River, which is also a Designated River and subject to Shoreland jurisdiction. No impact to 100

year flood elevations or disturbance within the 250' shoreland buffer is proposed. The LAC was contacted but no response has been received to date. The project is also located within the range of the federally threatened northern long-eared bat. Appropriate consultation with the US Fish and Wildlife Service will be completed. The NH Natural Heritage Bureau did not indicate records of any known protected species in the project area. The project area is located entirely within the Bath Upper Village Historic District (NR Eligible). The project is anticipated to qualify for the Section 106 Programmatic Appendix B, provided there are no significant visual impacts or permanent changes outside the existing ROW. Coordination with the Cultural Resources Program is underway. There are no anticipated adverse effects to water quality or proposed improvements that would require stormwater treatment. Review of the NHDES Aquatic Restoration Mapper found no data available for this crossing. Limited Reuse Soils will be managed appropriately. There are no point source contamination or PFAS concerns.

Streamstats predicts Q100 at 249 cfs for the revised 1023 ac boundary. Confidence limits were not provided.

The FHWA Regression Equations predict Q100 between 287 and 388 cfs. The SCS Method (Hydrocadd) was used for analysis, using the NOAA Atlas 14, 24 hr rainfall predictions. Design flows are as follows:

Q10 = 116 cfs Q50 = 269 cfs Q100 = 350 cfs

Analysis indicates the existing culvert can pass just under a 10-year design storm (about 3" of rain in a 24 hour period) before bypass occurs. At higher flows, bypass flow occurs into the fields to the south and eventually to another box culvert crossing under US 302 located about 1,750' to the south. The adjacent field to the north is lower than the culvert inlet channel bank and provides about 5 ac-ft of storage for incoming runoff from the north. With bypass flow included, the existing crossing can accommodate the 100 year storm. There is no indication that bypass flow causes any damage.

Alternatives considered included replace in kind with a 6' span structure, replacement with a 9' span structure, and replacement with a rules compliant 10' span structure. Span structures in the 6' – 9' range would not be classified as bridges whereas a span of 10' or more would be a bridge. Span structures alternatives in the 6' to 9' range would all be precast concrete box culverts, embedded 12" to improve AOP, and with a 3' clear height to avoid impacting the US302 road profile. Hydraulic requirements for a Bridge would require a span larger than the 10' compliant span. The Bridge option would be a 5' clear height x 16' span structure requiring raising the US 302 profile approximately 3', significant widening of the inlet and outlet channels, additional fill in the 100 year floodplain, and permanent ROW or easement acquisitions. Material would need to be excavated elsewhere to offset the new fill in the floodplain, likely requiring ROW acquisition of some cropland. Roadway reconstruction would extend about 450' north and south of the culvert. Cost for this option is estimated at \$1.43 million. Funding and design time would require a delay in the start of construction of 3 – 5 years, making this alternative not practicable under this Program.

The minimum acceptable alternative would be replacement in-kind with a 6' span culvert, with the addition of 12" of simulated streambed material in the culvert. Cost for this option is estimated at \$467,000 and about 3 months to construct. The new culvert would be constructed at the same location, same length, and same streambed inverts, and would only require minimal temporary impacts outside the ROW. The new culvert would be constructed using one lane alternating two-

way traffic controlled by a temporary signal. Consideration of costs, benefits, and impacts resulted in selection of a 9' span x 3' clear height embedded box culvert as the preferred alternative. Increasing the span from 6' to 9' would improve capacity enough to pass the 10 year design storm without bypass. Cost for this option is estimated at about \$500,000. Construction methods, duration, and impacts would be about the same as for the replace in kind option.

The proposed culvert will be in the same location, same length, and with the same streambed inverts. It will have straight concrete headwalls at inlet and outlet similar to the existing headwalls. Changes to the roadway and adding guardrail are not proposed. The proposed culvert will increase capacity, from 73 cfs for existing to 109 cfs for proposed. The frequency of overtopping of the inlet channel will decrease slightly, and the proposed culvert will pass the 10 year storm without bypass. Higher flows would continue to bypass to the south. The downstream channel can accommodate the additional flow. There will be no significant effect on velocity, flooding, or sediment transport. There will be no effect on FEMA maps or downstream structures.

The replacement culvert will be within the existing ROW. Access to the culvert will be from the edge of US 302. Slopes are very flat and there are farm access points adjacent to the culvert inlet and outlet. No special access considerations are anticipated. Temporary construction easements will be required at the inlet and outlet for staging areas, water diversion, and erosion controls. Easement areas will be restored to existing conditions. No impact to agricultural operations is anticipated.

Total disturbed area for the project will be just over 1/3 acre (0.36 ac ~15,700 sf) including removal and replacement of pavement. There will be minimal clearing, as there are very few trees greater than 3" dbh. Water diversion will likely be through a temporary pipe installed just outside the culvert excavation limits.

Final water diversion plan will be per the Contractor's approved SWPPP. Permanent stream impacts will be required for grading around the new headwalls and for channel matches. Limits are about 10' upstream and downstream of the existing culvert. Temporary Impacts will be required for access, water diversion, and erosion controls. Upstream limit of temporary impact is about 45' from the existing inlet and downstream limit is about 68' from the existing outlet. Estimated impacts are as follows:

Permanent channel = 1785 SF, Permanent Bank = 114 SF, Total Permanent Impacts 289 SF / 60 LF,

Temporary impacts 1,181 SF / 277 LF, Total Project Impacts (Temp + Permanent) = 1,470 SF

NHDOT requests that no mitigation be required as the total SF and LF impacts are under the thresholds, the proposed culvert will increase capacity slightly and have no effect on any other function or value of the crossing, the existing streambed and banks have been altered by agricultural maintenance operations and will likely be altered again periodically, and no riprap or stone armor is proposed due to low velocities and to avoid interference with future agricultural maintenance. NHDOT also requests preliminary concurrence for replacement under 904.10 Alternative Design, because the proposed culvert would not meet at least one of the criteria under 904.07, specifically: 904.07(4) The culvert would not provide a vegetated bank or wildlife shelf within the structure. The proposed culvert would meet all of the general design criteria under 904.01 and comply with all of the other 904.07 provisions to the maximum extent practicable.

Lori Sommer, NHDES Wetlands Bureau, concurred that the project would require an alternative design and requested that the project narrative include details about the adjacent agricultural disturbance and other justifications for why a compliant structure is not feasible. L. Sommer also concurred that no mitigation would be necessary for the project as proposed. L. Sommer inquired about revegetating disturbed banks and C. Carucci responded that the Department will stabilize and seed areas disturbed as part of the project.

There were no further comments.

This project has not been previously discussed at a Natural Resource Agency Coordination Meeting.

Sandwich, #43487

Kerry Ryan, NHDOT Environmental Manager, gave an overview of the location of the proposed state funded bridge maintenance project, bridge 226/162, which carries NH Route 113A over Mill Brook in Sandwich. The existing structure is an elliptical corrugated metal pipe and was constructed in 1957. The surrounding area is rural/undeveloped. This is a Tier 3 crossing. Photos were shown of the project area from NH Route 113A, the structure and surrounding area at the inlet and the outlet of the pipe, existing rip rap at both the NW and SW corners of the bridge, and the existing perch.

Tim Boodey, NHDOT Bridge Maintenance Senior Engineer, described the proposed project which will include installation of a concrete invert inside the corrugated metal pipe, installation of fish weirs at the downstream side to eliminate an existing perched condition and allow for organism passage, and replacement of rip rap at the NW corner at the inlet side and SW corner at the outlet side to protect the existing infrastructure.

Preliminary wetland impact plans were shown identifying the locations of the existing rip rap, proposed rip rap replacement, proposed fish weir, sandbag cofferdam, work zone access path, and staging area. A sandbag cofferdam and a clean water bypass pipe through the structure will be installed for the concrete invert construction. The sandbag cofferdam and clean water bypass pipe will then be moved for the installation of the fish weir structure. The proposed rip rap at the SW corner was shown at a smaller scale. Tim further explained the installation of the rip rap at the SW corner will impact approximately 7 sf of delineated wetland above the ordinary high water, in addition to the existing rip rap footprint.

The longitudinal profile was shown and will be included in the permit application. The culvert outlet is slightly higher than the inlet, therefor retains water during most flows. Due to existing grades at the outlet, two fish weirs will be required to eliminate the existing perch during low flow and get the water level to the outlet elevation. Additional fill will also be included at the fish weir installation location at the outlet in order to eliminate the perched condition between the proposed invert and existing stream bed.

The proposed project is anticipated to begin November or December 2021 and will take approximately four months to complete. The construction sequence includes: installation of cofferdams, perimeter controls, and sedimentation basin; installation of a clean water bypass pipe; construction of concrete invert; relocate the sandbag cofferdam and clean water bypass pipe in order to construct the fish weirs; installation of fish weirs; installation of rip rap at the NW and SW

corners of the bridge. Perimeter controls will remain in place until any disturbed areas are revegetated.

Hydraulic analysis determined the existing culvert passes the 100-year storm event and will also post construction. The 100-year storm event water level will be shown on the longitudinal profile in the application. It was determined adding the water level control structure and fill at the outlet of the structure will not affect the capacity of the structure during high flow events. The structure is currently inlet controlled.

K. Ryan described the area as not being a designated river or protected shoreland area, and previous permits were not identified at the location. Portions of the project area were determined to be in a PRA. It was reiterated the project would only include approximately 7 sf of permanent impacts to the PRA, for the rip rap installation at the SW corner, while the remaining PRA impacts would remain within the existing rip rap footprint. The project is within the FEMA 100-year floodplain. Mill brook is identified as a cold water stream and NHFG data shows the presence of eastern brook trout and blacknose dace upstream and downstream. The area was not identified as EFH and no resources were identified on the NHB report. The IPaC Official Species List identified NLEB and the project was determined to have no effect on the species. The project was determined to have no potential to cause effects to cultural resources.

Lori Sommer, NHDES, asked how thick of a concrete invert is being proposed, where is the 7 sf impacts coming from, and what is the additional fill at the outlet for? T. Boodey answered the concrete invert will be 6", the 7 sf is for permanent impacts to the delineated wetland for rip rap installation in front of the existing wing wall, and the additional fill is to bring the water level up, not just due to the additional 6" from the invert installation, but because the existing pipe is perched. He explained although it is not visible in the longitudinal profile, there is a drop at the outlet so, to bring material up to the bottom of the pipe, to account for the 6" from the invert installation, and to allow for AOP, fill will be installed in that area, which will be a permanent impact.

L. Sommer said we would want to look at that in terms of any new rip rap being placed and potential mitigation and asked about the two fish weirs. T. Boodey answered there is enough of a grade difference that the project will be unable to just use one fish weir and although the second weir was not shown on the profile, it would be installed between the fish weir that is shown on the profile and the end of the structure.

Andy O'Sullivan asked if the additional material was to fix the perch. T. Boodey answered it was, to bring the water level up at the perch so water flows through the structure and additional material is being brought in to eliminate the perch and therefore allow other critters to get through the pipe.

A. O'Sullivan asked L. Sommer if we the project is proposing to fix the perch if just the footprint of the fish weir itself needs mitigation. L. Sommer responded she was trying to figure out if both are needed. T. Boodey said that in the past, any work that has been done to allow for both fish passage and AOP has been considered self-mitigating because we are mitigating an existing condition in addition to addressing the work that we are doing.

L. Sommer asked what is the current perch, the depth. T. Boodey answered approximately 1'. Cheryl Bondi asked what is the proposed decrease of the perch. She explained the proposed decrease in perch is needed in order to determine if the project is self-mitigating and to determine what the improvement is to AOP. T. Boodey answered the result would be that water would flow continuously through the pipe, even during low flow conditions. C. Bondi asked if there would be no perch, no drop in water elevation at the outlet that a fish would have to jump up, from 1' drop to 0'. Boodey responded two fish weirs will be installed in order to not have a drop at the end of the

pipe and the 1' is from the bottom of the culvert, the existing steel, to the stream bed. Tim referenced the photo of the existing perch and explained the stream bed is lower than the existing invert and it is approximately 2-3" from the existing invert to the water level. C. Bondi asked if after the two fish weirs are installed, if the drop will be eliminated. T. Boodey responded it would. L. Sommer asked if we could do one or the other, either install fill or fish weirs to bring up the water level, but not both and she wants to see the information that necessitates the use of the outlet fill and the two fish weirs. T. Boodey answered the two weirs are to get the water through the culvert so there is no drop in water elevation at the culvert outlet.

Carol Henderson asked if the weirs are successful in elevating the water through the pipe are efficient they why use both. T. Boodey said because of the 1' depth, the fill would be installed so there wouldn't be as large of a gap between the stream bed and the bottom of the pipe and would also allow for additional AOP. L. Sommer said she is concerned because the outlet is already higher than the inlet. C. Henderson added that if just fish weirs, it will allow for fish passage because there will be flow through water however, the perch from the metal to the bottom may be high enough that other species, such as turtles, may not be able to access. M. Urban added that he understood that to be the case. C. Bondi asked for confirmation that the hole in front of the culvert will be filled in and then on top of that install two fish weirs. M. Urban said yes. T. Boodey added because of the difference in grade at the outlet, it is unlikely to be obtainable with just one weir. L. Sommer said weirs need to be shown and the design cross section need to be shown on the plans and the material that will be used. L. Sommer said the PRA would require mitigation and the fill at the outlet would require mitigation. C. Henderson said if can get the water level up in structure, turtles can swim and don't need to crawl along the bottom and asked what the structure in front of the pipe is and if it will be removed. T. Boodey answered that the structure was put in place due to beaver activity in the area and the device is in place so that future beavers would construct dams on the outside of the pipe and therefore more easily removed. M. Urban added we are trying to increase AOP for not just fish, but other amphibians and macroinvertebrates L. Sommer stated conditions will be included in the permit regarding fish weir construction and monitoring for up to five years. A. O' Sullivan asked for clarification if mitigation would be required for the PRA and the fill material to fix the perch, or just for the weirs themselves. L. Sommer responded just to fix the perch.

Mike Hicks, ACOE. had no comments

Pete Stickler, NC, had no comments